

REMARKS

Claims 50 and 52-56 are pending in this application. By the previous Office Action, claims 50, 52-56, 63 and 65 are rejected under 35 U.S.C. §103(a). By this Amendment, claim 50 is amended to incorporate the subject matter of claims 63 and 65 and claims 63 and 65 are canceled. No new matter is added.

Applicants thank the Examiner for the indication that the previous rejection under §112 has been overcome and withdrawn.

I. Rejection Under §103

Claims 50, 52-56, 63 and 65 are rejected under 35 U.S.C. §103(a) over Kobayashi. Applicants respectfully traverse this rejection with respect to the amended claims.

Independent claim 50 is directed to a wettability changing layer comprising a wettability changing material and a metal salt, wherein: the layer has a thickness of 100 to 1,000 angstroms; the layer is capable of charge-injection and/or charge-transfer; and wettability of the layer changes when light energy is applied to the layer. The metal salt is selected from the group consisting of FeCl₂, FeCl₃, Cr(NO₃)₃, CrCl₃, NaNO₃, Ca(NO₃)₂, Sr(NO₃)₂, Co(NO₃)₂, CoCl₂, Cd(NO₃)₂, Mg(NO₃)₂, Cu(CH₃COO)₂, Cu(NO₃)₂, Ni(NO₃)₂, Mn(NO₃)₂, MnCl₂, PbNO₃, RuCl₃, IrCl₄, Ir(NO₃)₃, ScCl₃, Sc(NO₃)₃, H₂PtCl₆, RhCl₃, Tb(NO₃)₃, Pr(NO₃)₃, Dy(NO₃)₃, Sm(NO₃)₃, Ga(NO₃)₃, Gb(NO₃)₃, Yb(NO₃)₃, NbCl₅, ZrCl₄, Zr(NO₃)₂, KNO₃, LiNO₃, HAsCl₄, Pd(NO₃)₂, Eu(NO₃)₂, Nd(NO₃)₂, NiCl₃, Ce(NO₃)₃, CsNO₃, Er(NO₃)₃, Ba(NO₃)₂, La(NO₃)₃, AgCl, CH₃CH(OH)COOAg, AgNO₃, TiNO₃, Y(NO₃)₃, Pb(NO₃)₂, Ho(NO₃)₃, Bi(NO₃)₃ and mixtures thereof. Such a wettability changing layer is nowhere taught or suggested by Kobayashi.

The requirements for a prima facie case of obviousness are specified and described in MPEP §2143. According to MPEP §2143, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation to modify the

reference. Second, there must be a reasonable expectation of success. Third, the prior art reference must teach or suggest all the claim limitations. Kobayashi fails to teach or suggest all the claim limitations.

According to the claimed invention, it was found that the wettability changing layer as claimed has charge injection and/or charge transfer properties, as well as the ability to form patterns different in wettability by pattern-wise light emission. In the claimed invention, the wettability changing layer exhibits the charge injection and/or charge transfer properties independently of the variation of the wettability. The charge injection property is enhanced by use the specific metal salts specified in claim 50. As such, the wettability changing layer can be used as a component layer of, for example, an electroluminescent device. Furthermore, because the wettability changing layer has the ability to form patterns different in wettability by pattern-wise light emission, another component layer of, for example, an electroluminescent device, can be easily formed pattern-wise without using such complicated techniques as etching and the like.

A. Kobayashi Does Not Teach or Suggest the Claimed Metal Salts

Claim 50 specifically requires that the wettability changing layer also comprises a metal salt selected from the group consisting of FeCl_2 , FeCl_3 , $\text{Cr}(\text{NO}_3)_3$, CrCl_3 , NaNO_3 , $\text{Ca}(\text{NO}_3)_2$, $\text{Sr}(\text{NO}_3)_2$, $\text{Co}(\text{NO}_3)_2$, CoCl_2 , $\text{Cd}(\text{NO}_3)_2$, $\text{Mg}(\text{NO}_3)_2$, $\text{Cu}(\text{CH}_3\text{COO})_2$, $\text{Cu}(\text{NO}_3)_2$, $\text{Ni}(\text{NO}_3)_2$, $\text{Mn}(\text{NO}_3)_2$, MnCl_2 , PbNO_3 , RuCl_3 , IrCl_4 , $\text{Ir}(\text{NO}_3)_3$, ScCl_3 , $\text{Sc}(\text{NO}_3)_3$, H_2PtCl_6 , RhCl_3 , $\text{Tb}(\text{NO}_3)_3$, $\text{Pr}(\text{NO}_3)_3$, $\text{Dy}(\text{NO}_3)_3$, $\text{Sm}(\text{NO}_3)_3$, $\text{Ga}(\text{NO}_3)_3$, $\text{Gb}(\text{NO}_3)_3$, $\text{Yb}(\text{NO}_3)_3$, NbCl_5 , ZrCl_4 , $\text{Zr}(\text{NO}_3)_2$, KNO_3 , LiNO_3 , HAsCl_4 , $\text{Pd}(\text{NO}_3)_2$, $\text{Eu}(\text{NO}_3)_2$, $\text{Nd}(\text{NO}_3)_2$, NiCl_3 , $\text{Ce}(\text{NO}_3)_3$, CsNO_3 , $\text{Er}(\text{NO}_3)_3$, $\text{Ba}(\text{NO}_3)_2$, $\text{La}(\text{NO}_3)_3$, AgCl , $\text{CH}_3\text{CH}(\text{OH})\text{COOAg}$, AgNO_3 , TlNO_3 , $\text{Y}(\text{NO}_3)_3$, $\text{Pb}(\text{NO}_3)_2$, $\text{Ho}(\text{NO}_3)_3$, $\text{Bi}(\text{NO}_3)_3$ and mixtures thereof. Kobayashi does not teach or suggest these metal salts.

The Office Action cites Kobayashi at col. 18, line 65 to col. 19, line 10, as disclosing the incorporation of charge facilitator metal salts. However, the charge facilitators of Kobayashi do not correspond to the claimed metal salts. At the cited passage of Kobayashi, the reference merely discloses:

The structure for pattern formation may be rendered sensitive to visible and other wavelengths by doping with metal ions of chromium, platinum, palladium or the like, by addition of fluorescent materials, or addition of photosensitive dyes. Examples of dyes usable herein include cyanine dyes, carbocyanine dyes, dicarbocyanine dyes, hemicyanine dyes, and other cyanine dyes. Other useful dyes include diphenylmethane dyes, for example, triphenylmethane dyes, such as Crystal Violet and basic fuchsine, xanthene dyes, such as Rhodamine B, Victoria Blue, Brilliant Green, Malachite Green, Methylene Blue, pyrylium salts, benzopyrylium salts, trimethylbenzopyrylium salts, and triallylcarbonium salts.

Col. 18, line 65 to col. 19, line 10.

Nowhere does Kobayashi teach or suggest the specific metal salts recited in claim 50. Further, nowhere does Kobayashi teach or suggest that the metal salts could or should be included in a wettability changing layer to enhance a charge injection property of the layer. Kobayashi thus does not teach or suggest all of the limitations of the claimed invention.

B. Kobayashi Does Not Teach or Suggest the Claimed Thickness

According to the claimed invention, the wettability changing layer specifically has a thickness of 100 to 1,000 angstroms. This dimension is important, because a thickness of 100 angstroms or more provides the above-described wettability properties, while a thickness of 1,000 angstroms or less provides the good charge transfer properties. See specification at page 12, lines 16-24. Thus, thicknesses below 100 angstroms are excluded from the claims as not providing the claimed wettability properties, while thicknesses above 1,000 angstroms are also excluded from the claims as not providing the claimed good charge transfer properties.

In contrast to the claimed thickness range of 100 to 1,000 angstroms, Kobayashi discloses a photocatalyst-containing layer that is suitable for use in a structure for pattern

formation, a color filter, a lens or a lithography plate. *See, generally*, columns 5 to 10. However, nowhere does Kobayashi teach or suggest that the disclosed photocatalyst-containing layer specifically has a thickness of 100 to 1,000 angstroms. In fact, as pointed out in the Office Action, Kobayashi merely discloses that the photocatalyst-containing layer should have a thickness of not more than 10 μm , or 100,000 angstroms. The disclosed thickness range of Kobayashi thus broadly encompasses not only the 100-1,000 angstrom range as claimed, but also encompasses the lower range of 0-100 angstroms and the higher range of 1,000-100,000 angstroms, both of which are excluded from the instant claims.

Although Kobayashi discloses a range that encompasses the claimed range, Kobayashi would not have rendered obvious the claimed range. For example, Kobayashi broadly teaches and implies that the whole disclosed range is suitable and any thickness within the range could be used. However, Kobayashi does not teach or suggest that the lower end of the range -- a thickness of 100 angstroms or less -- does not provide the desired wettability properties, while the upper end of the range -- a thickness of more than 1,000 angstroms -- does not provide the desired good charge transfer properties.

Instead, the thickness range in Kobayashi is many orders of magnitude larger than the claimed range, and a majority of the range of Kobayashi is not only outside of the scope of the present claims, but would not provide the desired properties. That is, Kobayashi discloses a range of not more than 10 μm , or not more than 100,000 angstroms. However, Kobayashi does not teach or suggest that the thickness should specifically be in the claimed range of 100 to 1,000 angstroms, as opposed to the excluded ranges of 0-100 angstroms or 1,000-100,000 angstroms. Moreover, in the Examples, Kobayashi expressly teaches that the thinnest layer has a thickness of 0.2 μm , or 2,000 angstroms, which is twice as thick as the thickest layer encompassed by the present claims.

Kobayashi does not teach or suggest that the layer could or should be made to have a much smaller thickness, as claimed. Kobayashi does not teach or suggest that the thickness could or should be reduced simply to provide a smaller part, as asserted in the Office Action. Nor does Kobayashi teach or suggest that the thickness is a result-effective variable, which could or should be optimized for any specific reason.

Thus, Kobayashi fails to teach or suggest at least this feature of the claimed invention.

C. Kobayashi Does Not Teach or Suggest the Claimed Charge Injection and/or Charge Transfer Properties

Furthermore, Kobayashi also does not teach or suggest that the wettability changing layer is capable of charge-injection and/or charge-transfer. For example, Kobayashi also does not teach or suggest that the thickness of the layer could or should be modified so as to provide the charge injection and/or charge transfer properties.

Whereas the present specification teaches that the claimed thickness range of 100 to 1,000 angstroms provides the charge injection and/or charge transfer properties, Kobayashi nowhere teaches or suggests that these properties can be provided at all in the disclosed product, much less in the product by specifically selecting the thickness of the layer.

Kobayashi does not disclose the particular advantages of this narrower range discovered by the present inventors -- thicknesses of 100 angstroms or more to provide good wettability patterning characteristics, while thicknesses of 1000 angstroms or less provide good charge-injection and/or charge-transfer characteristics.

In fact, Applicants submit that most of the thickness range disclosed in Kobayashi would not even provide the desired charge injection and/or charge transfer properties obtained by the claimed invention. For example, a photocatalyst-containing layer of 10 micron thickness as disclosed in Kobayashi would be too thick to provide the charge injection and/or charge transfer properties. Likewise, if a layer is too thin, such as 50 angstroms, the layer

also does not provide the charge injection and/or charge transfer properties. See, for example, Example B-2-1 of the present application, where a 50 angstroms layer also does not provide the charge injection and/or charge transfer properties.

Kobayashi does not teach or suggest that any different properties can be obtained when the thickness of the layer is varied, and thus does not teach or suggest that varying the layer thickness can provide optimum workable values for the thickness parameter. Thus, Kobayashi fails to teach or suggest at least this additional feature of the claimed invention.

D. Conclusion

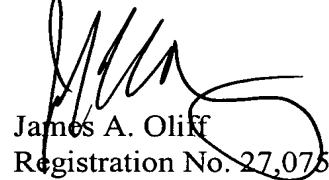
Accordingly, Kobayashi fails to teach or suggest each and every feature of claim 50. Claim 50 thus would not have been rendered obvious by Kobayashi. Claims 52-56 depend from claim 50 and, thus, also would not have been rendered obvious by Kobayashi. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

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